PULMONEX II DOUBLE-TRAP XENON SYSTEM

OPERATION MANUAL

132-503

BIODEX
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FN: 07-151 Rev A 10/09

PULMONEX II DOUBLE-TRAP XENON SYSTEM

This manual covers installation and operation procedures for the following Biodex products:

#132-503 Xenon System, Pulmonex II, Double-Trap, 115 VAC

NOTE: *Activate your product warranty. Register online @ www.biodex.com/warranty*

NOTE: All or some of the following symbols, cautions, warnings and notes may apply to your Atomlab 950 and correspond to this operation manual:

Symbol	***Meaning***
⚠	*Attention: Consult accompanying documents.*
⚠	*Symbol Signification: Attention, se référer à la notice.*
⚠	*Warning: Injuries to health may result from incorrect or excessive training.*
⚠	*Attention: incorrect ou extrême entrainement peut aboutir des lesíons au santé.*
⚠	*Caution: Disconnect power from source before removing panel or covers. Reliable grounding achieved only by connecting this unit to an equivalent marked hospital only or hospital grade receptacle.*
⚠	*Attention: Déconnecter la prise secteur avant d'ouvrir le coffret. Une terre fiable ne peut être obtenue que par la connexion à une prise secteur de qualité hospitalière.*

NOTE: *Circuit diagrams for this product are available upon request.*

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1. INTRODUCTION

The combination of manual and electronic controls makes the Pulmonex II Double-Trap Xenon System the easiest unit to use for regional ventilation studies. All internal circuitry, valves and tubing have been designed to afford simple operation with complete patient comfort. The result is a system that provides maximum, reliable test results with minimal effort.

Before using the Pulmonex II on an actual patient, we suggest making several dry runs through the following operation procedures (without using Xenon). Having become familiar with the operating routine, ask a colleague to stand-in as a practice patient and try the procedures again. Once you feel fully comfortable operating the Pulmonex II, you will be able to perform Xenon studies on any patient with complete confidence.

NOTE: *Because the Pulmonex II uses a temperature-sensitive valve which must acclimate to the immediate environment, the system must reside for several hours in the department where it will be used prior to performing any studies.*

NOTE: THIS ADDENDUM REPLACES PAGE 5 in Section 2: "SET- UP PROCEDURE"

2. SET-UP PROCEDURE

(See Figures 1 - 7.)

1. Open lower front door. All hoses should be connected to their respective ports. *(See Figure 1.)*

2. Open the top door. The Pulmonex II has been shipped with a pre-filled disposable single use Drierite cartridge that is located on the right side of the compartment. We have supplied 6 additional cartridges with the sample Xenon Disposable Convenience Kits. The disposable mixture of blue and white Drierite crystals prolongs charcoal trap life span. Failure to change the moisture absorber regularly will significantly shorten the life span of the charcoal trap; therefore, it is recommended that the pre-filled disposable cartridge be changed after every study. The replacement part number for this cartridge is 132-772. (See Figure 2.)

   NOTE: *The flow arrow on the pre-filled disposable Drierite cartridge should match the flow label in the Pulmonex II cabinet.*

   NOTE: *The pre-filled disposable Drierite cartridges supplied with the Pulmonex II are for single patient use only.*

3. Located on the left side of the top compartment is the pre-filled disposable single use Soda-Lime cartridge. This cartridge serves as a carbon dioxide trap. We have supplied 6 additional cartridges with the sample Xenon Disposable Convenience Kits. The disposable Soda-Lime cartridge helps stop the breakdown of Soda-Lime granules that may possibly clog the 10-way valve and hinder patient air flow. Failure to change the Soda-Lime regularly could cause the patient to hyperventilate; therefore, it is recommended that you change it after every study. The replacement part number for this cartridge is 132-773.

   NOTE: *The flow arrow on the pre-filled disposable Soda-Lime cartridge should match the flow label in the Pulmonex II cabinet.*

   NOTE: *The pre-filled disposable Soda- Lime cartridges supplied with the Pulmonex II are for single patient use only.*

4. Bring the unit to the area of operation. Ensure the Power Switch is OFF and the timer is OFF. Plug into a nearby electrical outlet.

5. At the rear of the unit, there are two black hose connections positioned side by side (see Figure 3.) The blue hose adapters in the open ends of hoses should be removed to connect to these fittings. The blue adapters are required to connect to the Hans Rudolph Valve and to older Pulmonex Systems only. Attach the 1.125" bore hose and Hans Rudolph Valve assembly to the hose connectors so that air flows into the Hans Rudolph Valve on the left and out from the Hans Rudolph Valve on the right. (see Figure 4.) The white diamond on the Hans Rudolph Valve faces up when connected. (see Figure 5.) Connect the bacteria filter directly to the Hans Rudolph Valve. Attach either a face mask or mouthpiece directly to the bacteria filter. (see Figure 6.)

   NOTE: *If you require longer tubing for your patient, you can attach a tube to the bacterial filters and then connect the mouthpiece or mask to this hose.*

   NOTE: *Keep the breathing tubes as short as possible. (See "Troubleshooting" section on Strong Breathing Resistance.) For supine patients, bring the system as close as possible to the bedside. As a safety precaution you can connect a hose from your room vent to the exhaust port located just below the overhang on the patient side of the Pulmonex II. Do not leave this connected all the time. It will shorten the life of the traps.*

   CAUTION: *Some patients are sensitive to Oxygen. Consult a physician before using Oxygen. If the physician prefers, substitute room air for Oxygen.*

   ATTENTION: *Certains patients réagissent à l'oxygène. Se référer à un médecin avant d'utiliser de l'oxygène. Utiliser l'air ambiant quand indiqué.*

6. To add Oxygen, connect and clamp a .25" Oxygen hose from your supply to the Oxygen inlet port on the Pulmonex II front panel.

Figure 1.
Ensure all hoses in lower cabinet are properly connected.

Figure 2.
The Carbon Dioxide absorber and moisture absorber cartridges are located in the upper cabinet

Figure 3.
Connectors for the 1.125" bore hose and Hans Rudolph Valve assembly are located on the back panel.

CAUTION: *Do not use humidified Oxygen.*

ATTENTION: *N'employez pas l'oxygène humidifié.*

7. Ensure that the shipping cap is removed from the exhaust port located on the lower cabinet on the rear of the unit (facing the patient).

8. In the lower cabinet is a plug socket that the power pack for the Xenon monitor can plug into. This socket receives power as long as the power switch to the Pulmonex is ON. Do not plug anything but the Xenon monitor into this socket. (see Figure 7.)

Figure 4.

3. PERFORMING A STUDY
(See Figure 8)

NOTE: *Oxygen input should not exceed eight psi. Oxygen input flow rate should be six to eight liters/minute, not to exceed 50 liters/minute.*

1. Using a source, position the patient in front of the scintillation camera. Ensure both lungs are within the crystal area.

2. Set the camera for Xe-133. Be prepared to record all data after Xenon injection.

3. Turn the Power Switch, located on the patient side of the unit, to ON. (0 is OFF, 1 is ON.)

   NOTE: *Even after the Power Switch is set to the ON position, power will not be evident until the Timer has been turned ON.*

4. Place the Pulmonex II as close to the patient as possible and set the handle to the "Start" position #1.

5. Set "Patient Air Flow" control to 30 (an arbitrary figure that can be changed to accommodate the patient's breathing pattern). Set "Trap Air Flow" control to "0".

6. Press the button on the front panel to add Oxygen to the "To Patient" bag. Only add a small amount of Oxygen, about one quarter full. (The bag will only move slightly, do not fill it up.) More Oxygen can be added later if it is required for the patient. In many cases, it is possible not to add any Oxygen and perform the entire study on ambient air. In all cases, the Oxygen is only to enrich the air in the circuit.

   NOTE: *To perform a study using ambient air, turn the Pulmonex II ON using the timer and proceed to set the handle to the "Single Breath, Equilibrium" position #2 before connecting the patient to the system. When the "To Patient" bag is one-quarter full, switch the handle back to position #1. To add ambient air, turn the Air Flow up to 100, add the desired volume, and turn the Air flow back to 30. The system is now ready to use.*

7. Make sure the system is in "Start" position #1.

8. Set the timer to nine minutes (an arbitrary figure that can be changed at any time depending on the study procedure).

9. Remove the face mask or mouthpiece from the tubing.

10. Place the face mask over the patient's face and attach mask retainer or mouthpiece and nose clip. Have the patient breathe to get accustomed to the face mask.

11. With the handle in the "Start" position #1, connect the mask to the hose. Instruct patient to breathe briefly while becoming accustomed to the face mask and tubing. The "From Patient" bag will move slightly as the patient exhales.

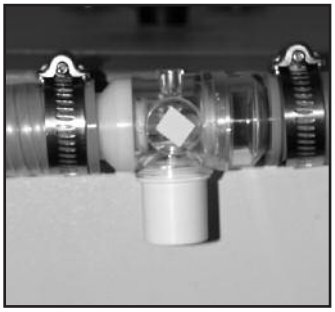


Figure 5.

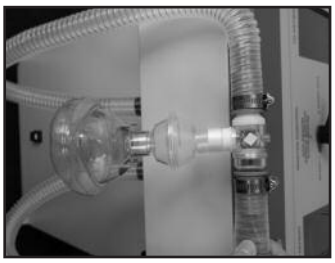


Figure 6.

Figure 7.

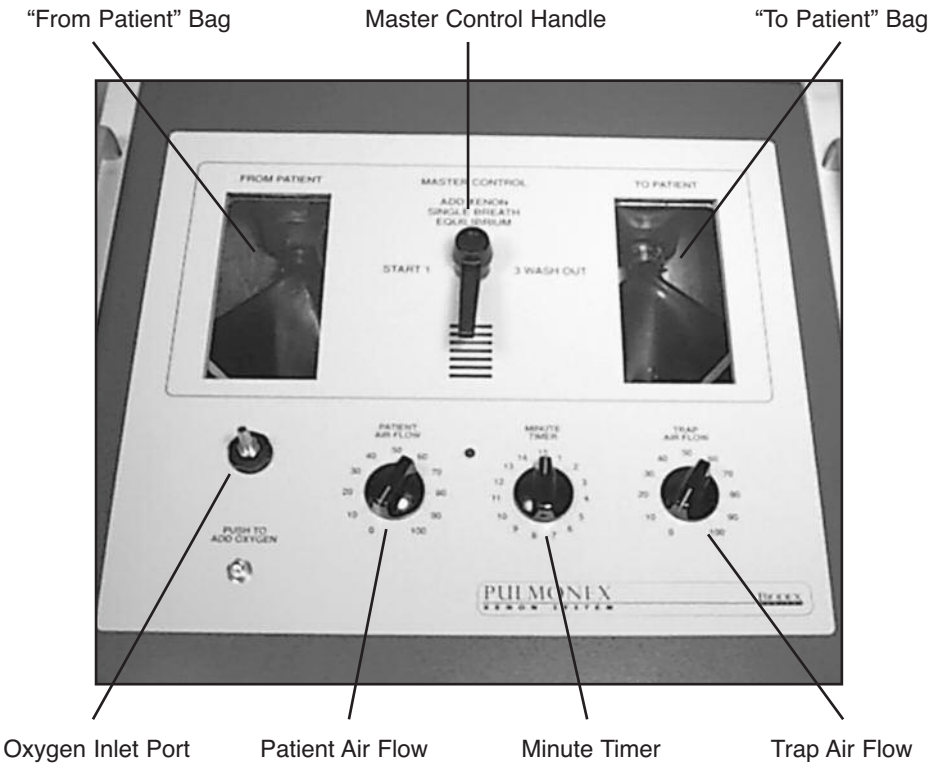


Figure 8.

12. Switch the handle to "Single Breath, Equilibrium" position #2. Use either an injector gun or a syringe filled with Xenon, and puncture the injection site of the face mask, mouthpiece or direct dose adapter. Add Xenon as the patient takes a deep breath. Instruct patient to hold breath for as long as possible. After exhaling, the patient should resume normal breathing while you increase the "Patient Air Flow" control to 40 (an arbitrary figure that can be changed to accommodate the patient's breathing pattern).

    Advise the patient to breathe normally. Observe breathing bags moving through the front panel windows. Add Oxygen if necessary for patient comfort.

    NOTE: *Patients with a large lung capacity or breathing faster will require a higher patient air flow speed (i.e.: 50) or higher. Do not make it too high or the patient will not be able to inhale.*

    NOTE: *If the Xenon is not getting to the patient for single breath, on future studies lower the "Patient Air Flow" control to 10 or 20 for approximately five seconds before Xenon administration. Instruct the patient to exhale and add the Xenon while the patient inhales.*

13. Once the patient reaches equilibrium (one to two minutes, the counting rate on the camera stabilizes), switch to "Washout," position #3. Turn the Trap Air Flow Control to 50 about 10 seconds before going to Washout. Take washout data on the camera (typical framing: first image, 15 seconds; second, 30 seconds; third, 60 seconds). Have the patient breathe normally.

14. Carefully watch the "From Patient" bag. If it starts blowing up, the patient is breathing too fast. Advise normalized breathing and increase the "Patient Air Flow" speed. If the bag continues to expand up towards the glass, the patient will feel back pressure and resistance. To relieve this effect, increase "Trap Air Flow" by turning the Trap Flow knob clockwise until the breathing bag deflates. Return the control to approximately one-half of its range when the study is complete. The use of this trap motor control will be a rare occurrence. Do not adjust unless absolutely necessary and be sure to return it to its original position. To be effective, the increase in motor speed must be accomplished before the bag is full, thus, it is vital to watch the "From Patient" bag carefully during washout.

    NOTE: *If the motors are running too fast it may be difficult for the patient to breathe in.*

15. When the washout is complete, remove the patient from the system. Allow the system to run for a few more seconds or until both bags are empty.

4. MAINTENANCE

General Maintenance Procedures

1. Biodex recommends that the moisture absorber and the soda-lime (CO_2 absorber) be changed after every study. Once granules change color, efficiency is already compromised. Absorber granules can also break down in size; the smaller granules and powder will potentially clog the system, hinder patient air flow and damage system circuitry. Biodex offers moisture absorber and soda-lime for refillable cartridges and in pre-filled disposable cartridges. Click into our Xenon Disposables section at www.biodex.com/lungventilation.

2. Administer the Xenon as close to the patient as possible. Having the Xenon enter the patient near the face mask or mouthpiece ensures a good bolus for single breath. (see Figure 9.) We recommend using an injection adapter as close to the patient as possible.

   Biodex carries an entire line of disposable Xenon kits, some with injection adapters, with luer lock fittings, or injection ports (see catalog). These options will allow the use of a Xenon gun, Xenon injection dispenser or syringe directly in line with the patient's breathing passage.

3. Test the trap effluent on a regular basis. Keep a formal record according to NRC, state or local regulations. The easiest and most efficient way to test the trap is by using the Xenon Trap Monitor (#136-752). If you do not have a monitor, refer to the Leak and Trap Test procedure explained later in this manual.

4. Periodically remove the two breathing tubes from the back of the unit. Take one tube and connect it to both ports, forming a C configuration. Place the handle in position #2 and press the Oxygen button until the bags are full and tight up against the glass windows. They should remain full for approximately two minutes. If they sag or fail to blow up tight, the system may have a leak. Refer to the Leak and Trap Test procedure as explained later in this manual.

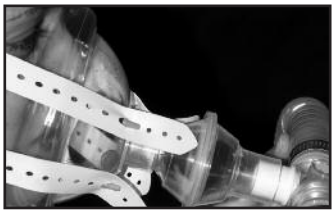


Figure 9.

Figure 10.

Maximizing Charcoal Trap Efficiency

In a Dual Trap System, it is recommended that the charcoal trap (#132-319) on the right side be replaced every 12 months. Move the left side trap to the right side and place the new trap on the left side. To maximize trap effectiveness, follow these guidelines:

1. After the patient has completed the washout, do not leave the system running for more than 30 seconds.

2. Monitor the trap air flow blower motor. It should be set at a maximum of 50-60 and only increased when a patient needs assistance during washout.

3. Change the moisture absorber after every study!

NOTE: *Do not leave the Pulmonex II in position #3 when not in use.*

Charcoal Trap Replacement Procedure

To Replace the Charcoal Trap:

1. Remove the right side trap.
2. Move the left trap to the right position.
3. Install the new trap on the left side.

NOTE: *Change the right trap side annually for average use.*

Upper Blower Replacement
Tools Required: Medium size Blade Screwdriver and 5/32" HEX Tool

1. Using a 5/32" HEX Tool screwdriver, remove two HEX screws from the rear of the upper panel. Then remove two screws from the upper panel behind the front drop down door.

2. With the top panel loose, you may prop up the panel from the rear of the unit using a 12-inch block of wood. This will provide access to the upper blower.

3. The Blower is located on the underside of the front panel leftside location.

4. Locate Blower and remove two hoses (note orientation) and disconnect electrical connector. (see Figure 10.)

5. Using Blade screwdriver, unfasten snap ring bracket by inserting blade in slot and twist. Remove Blower.

6. Replace Blower snap bracket, reattach hoses (note orientation), reconnect electrical connector.

7. Test for proper operation.

8. Replace cabinet front panel and secure with four screws.

If you have any additional questions, contact Biodex Support Services at 1-800-224-6339 or 631-924-9000, ext. 2124 or ext. 2125.

Lower Blower Replacement
Tools Required: Medium size Blade Screwdriver

1. Locate Blower in lower cabinet on the back wall.

2. Remove hoses (note orientation), disconnect electrical connector.

3. Using a Blade screwdriver, unfasten snap ring bracket by inserting blade in slot and twist. Remove Blower.

4. Replace Blower snap bracket, reattach hoses (note orientation) reconnect electrical connector.

5. Test for proper operation.

Leak Test
The following procedures are a simple yet effective means of testing the delivery and breathing portion of the Pulmonex II system for leaks. Tests A and C should be done with the Pulmonex II turned OFF.

Test A
(Be sure Pulmonex is turned OFF).

1. Connect one hose between the “To Patient” port and the “From Patient” port located on the patient side of the system.

2. With the system in position #2 and the Oxygen supply connected, depress the “Add Oxygen” button on the front panel of the system and fill until both bags are full and pressed up against the front viewing windows.

3. Turn OFF the Oxygen supply. Listen carefully for any leaks (the bags should remain full for at least one minute.) If no leak is found, empty the bags, and replace outside hoses and fittings.

IF A LEAK IS SUSPECTED
Remove the four screws that hold the front panel in and raise the panel slightly. Now feel inside for any leaks.

IF A LEAK IS FOUND IN A HOSE
Replace the entire section. Occasionally, one of the breathing bags will tear or a hole will develop. These bags are Biodex Medical Systems (catalog #130-610 and are easily replaced. If the leak is in one of the fittings, they can be easily sealed with silicone.

NOTE: *If you suspect a leak but it is proving hard to find, move on to test B.*

Test B
(Turn Pulmonex ON).

1. Connect one hose between the “To Patient” port and the “From Patient” port located on the patient side of the system.
2. Empty both bags by putting into position #3.
3. Put system in position #1.
4. If the “To Patient” bag blows up, very carefully check to see if the fitting connecting the blower to the blue adapter on the 10-way valve is broken.
5. If it is, run a bead of silicone around the fitting to seal it and let dry.
6. Now try steps #2 through #4 again. If the bag does not fill, repeat the leak test (Test A).
7. If the bag fills, call Biodex Medical Systems to replace the10-Way Valve (catalog #132-515).

Test C Oxygen Button Valve Leak Test
(Be sure Pulmonex is turned OFF).

1. With a hose connecting the two patient ports, connect the Oxygen supply and turn it ON.
2. If the “To Patient” bag fills without depressing the “Add Oxygen” button, this valve needs to be replaced.

Hose Set-Up
(See Figure 6 and Figure 11)

Proper Pulmonex II hose set-up is as follows:
Hose, then Hans Rudolph Valve, then bacteria filter, and then the face mask or mouthpiece placed directly onto the filter.

You may add an injection adapter between the filter and mask or mouthpiece. The diamond on the Hans Rudolph Valve should be pointing up. The Hans Rudolph Valve should flow in on the left and out on the right.

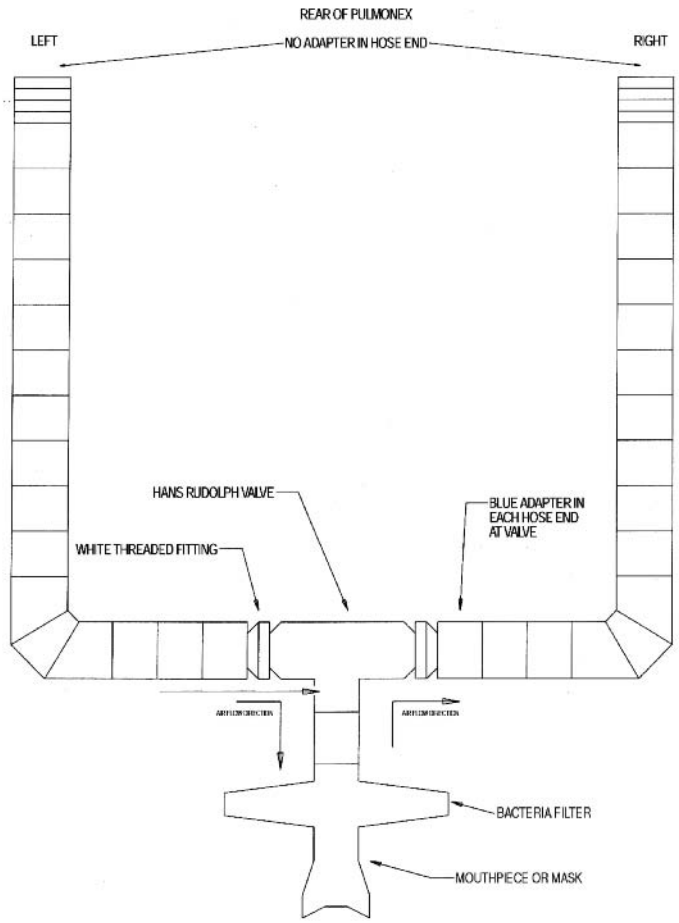


Figure 11. Pulmonex Tubing Setup

Manual Trap Test (Without Monitor)
Trap exhaust is monitored by using the gamma camera without a collimator. The following simple technique is used:

1. Remove the collimator from the camera.
2. With a five percent window, calibrate for Xe-133.
3. Fill a large plastic bag with a known volume of air (example, 25 liters).
4. Inject a known quantity of Xe-133 (such as 100 μCi) into the bag. The concentration will be 4 x 10-3 μCi/cm3.
5. Place the bag in front of the crystal and count for a known period of time. The counts per minute (cpm) obtained is a measure of the efficiency.
6. Collect the exhaust of a typical study in another bag of the same volume (25 liters) and count as defined in step #5.
7. Ratio the count rates to the standard taken to determine exhaust concentration.

Example: If 4×10^{-3} μCi/cm^3 yields 600,000 cpm above the background and collected effluent from the patient study was 150 cpm above the background, then:

$$\text{Ratio} = \frac{1.5 \times 10^{2} \text{ cpm}}{6 \times 10^{5} \text{ cpm}} = 2.5 \times 10^{-4}$$

$$\begin{aligned} \text{Exhaust Concentration} &= r\,(2 \times 10^{-3}\ \mu\text{Ci/cm3}) \\ &= (2.5 \times 10^{-4})\,(4 \times 10^{-3}\ \mu\text{Ci/cm}^3) \\ &= 1 \times 10^{-6}\ \mu\text{Ci/cm}^3 \end{aligned}$$

* MPC Xe-133 controlled areas should not exceed 1×10^{-5} μCi/cm^3

5. TROUBLESHOOTING

PROBLEM/PROBABLE CAUSE	SOLUTION
NO POWER	
Timer not on	Turn timer on
Power cord cut or broken	Replace cord
No power in outlet	Try different outlet
Incorrectly connected the transformer	Connect properly
ON/OFF switch is OFF	Turn switch to ON (1)
OXYGEN NOT GETTING INTO SYSTEM	
Tank or oxygen supply empty	Refill tank
Flow rate on tank not set high enough	Turn flow rate up
Not holding oxygen button down long enough	Button must be depressed for the whole time oxygen is to be added
Internal one-quarter hose has come off fittings	Reattach hose and re-clamp
XENON NOT GETTING TO PATIENT FOR SINGLE BREATH	
Injection not near the patient	Change injection location to a location closer to the patient
Injected when patient exhaled	Inject after patient exhales and starts inhaling
Patient air flow speed set too high	Turn blower speed down to 20 if Xenon is being drawn into system at least 15 seconds prior to injection of Xenon
Blower speed not set high	After injecting Xenon, blower patient air flow speed should be raised to at least a setting of 40, higher if necessary
Soda-Lime and Drierite cartridges more than one-third full	Cartridges should not be filled too full
Not enough oxygen supplied	Add more Oxygen (It can be added at any time during the study.)
Too much Oxygen put into the “To Patient” bag to start study	Only fill “To Patient” bag one-third full with Oxygen
Study runs too long	Shorten length of study. Equilibrium should not take any more than five to six minutes.
External hose cracked	Replace hoses
XENON NOT GETTING TO PATIENT FOR SINGLE BREATH/EQUILIBRIUM	
Gun clogged	Check gun
Injected Xenon in position #1 (start)	Inject in position #2
Main valve core not turning when handle is turned	Call Biodex Medical Systems
Bacterial filter absorbs Xenon	Change filter type to recommended filters supplied by Biodex Medical Systems
System leaks	See leak test
Patient hose set not set up properly	Correct Hans Rudolf Valve and hoses for proper directional flow
Is camera set for Xenon?	Set camera for Xenon
“TO PATIENT” BAG FILLS DURING STUDY	
Leak around face mask or nose clamp when mouthpiece is used	Make sure face mask retainer is tight. Make sure there is a tight seal around the mouthpiece and that nose clamp is being used
External hose cracked	Replace hose
Blower to 10-way valve fitting broken	See Test B
Oxygen valve leaks	Replace Oxygen valve (See procedure to test for leaks, Test C)

LOW COUNTS THROUGHOUT STUDY

Vial not completely emptying	Check vial before and after study
Not enough Xenon to start study	Use bigger dose of Xenon
Gun clogged	Check gun

LOSING COUNTS

Nose clip not being used with Mouthpiece	Use nose clip
Leak around mouthpiece or face mask	Make sure mask retainer or mouthpiece is secured properly
Cracks in external hose	Replace hose
Bacteria filter is absorbing Xenon	Use Biodex Medical Systems recommended bacteria filters (check filter for activity)
Plug-in injection fitting is not capped	Cap luer lock plug-in injection fitting

STRONG BREATHING RESISTANCE

Hoses are too long	Reduce length of tubing to 24" maximum for blue corrugated tube or 36" for 1-1.125" smooth-bore hose. Use tubing as short as possible.
Hoses on patient's side of Hans Rudolph Valve	Remove hose. Bacteria filter and face mask should be affixed directly to Hans Rudolph Valve.
Hans Rudolph Valve (Y or T style) is upside down	Hans Rudolph Valve should be attached so that air flows in on the left and out on the right. Diamond faces up.
One-way valves sticking	Replace Hans Rudolph Valve
Blowers running too fast	Reduce blower speed

"FROM PATIENT" BAG NOT EMPTYING DURING WASHOUT

Shipping cap not removed from exhaust port	Remove cap from exhaust port
Patient air flow blower speed set too low	Turn speed up to 60, higher if necessary
Trap air flow blower speed set too low	Generally, the trap air flow cabinet blower speed is set at 50, however, on some patients, it will have to be turned up
Blowers not running	Check power or replace blower
Breathing bags crimped	Uncrimp bags
Charcoal has settled in lead cartridge	Remove cartridge, turn upside down and shake gently, then replace cartridge

TRAP LEAKING XENON

Monitor not working	Check trap effluent manually
Crack in seam of cartridge	Seal with silicone
Loose fittings on cartridge	Seal fitting with silicone
Crack in hose to trap or hose is not attached	Replace or reconnect hose
Cartridge saturated	Replace cartridge
Charcoal has settled	Shake cartridge gently to loosen charcoal

OXYGEN HOSE COMES OFF

Input pressure too high	Adjust input pressure to not greater than eight psi
No clamp for hose at input fitting	Install clamp

6. SPECIFICATIONS

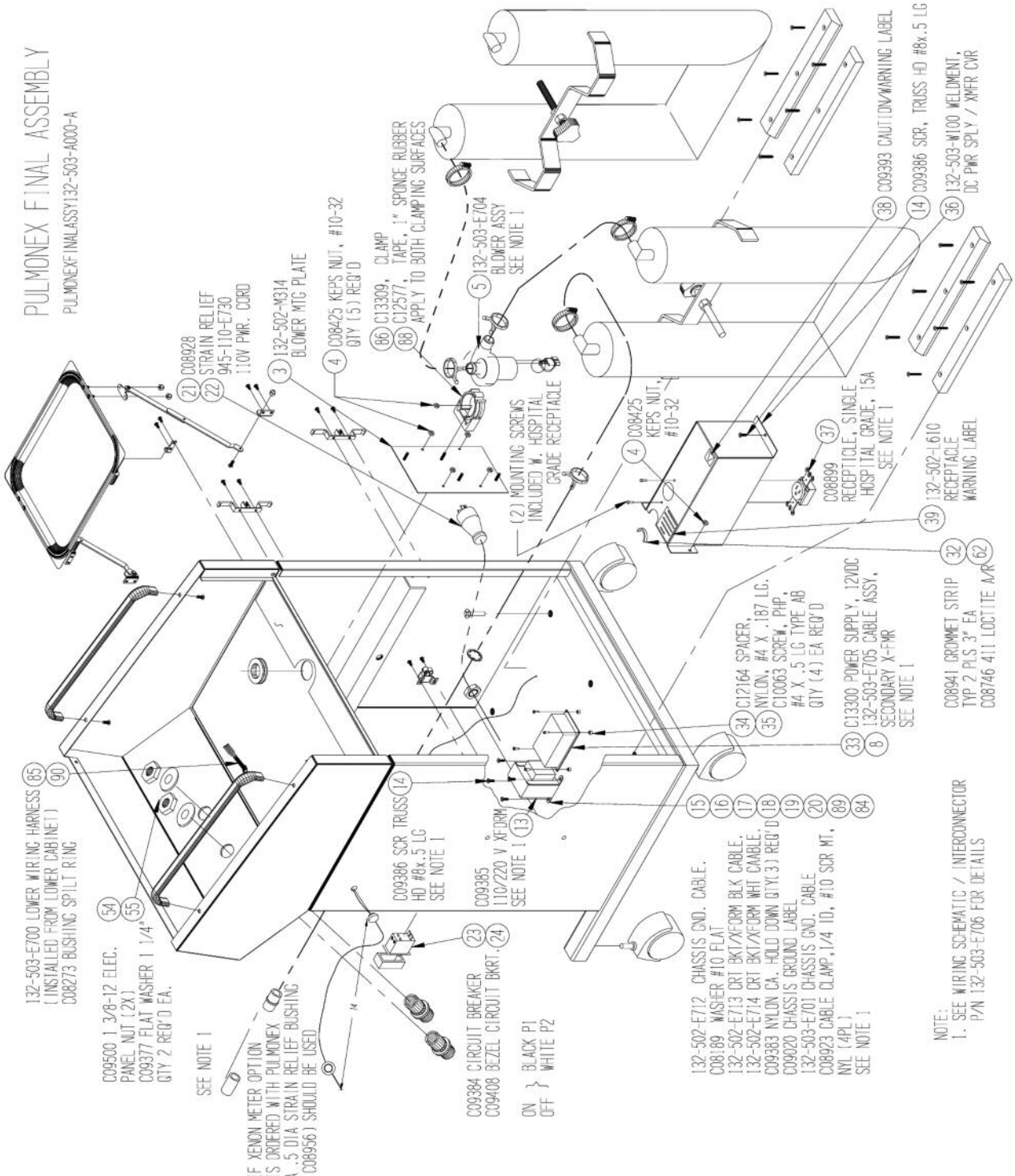
Dimensions: 48.5" h x 22" depth x 20.5" w (123.2 x 55.9 x 52.1 cm)
Motor: UL approved. 115 VAC, 50/60 Hz
Electrical Requirements: 115 vac, 1 amp or 230 VAC, 0.5 amp, 50/60 Hz
Shipping Weight: 375 lb (172.5 kg)
Certifications: ETL and cETL Listed

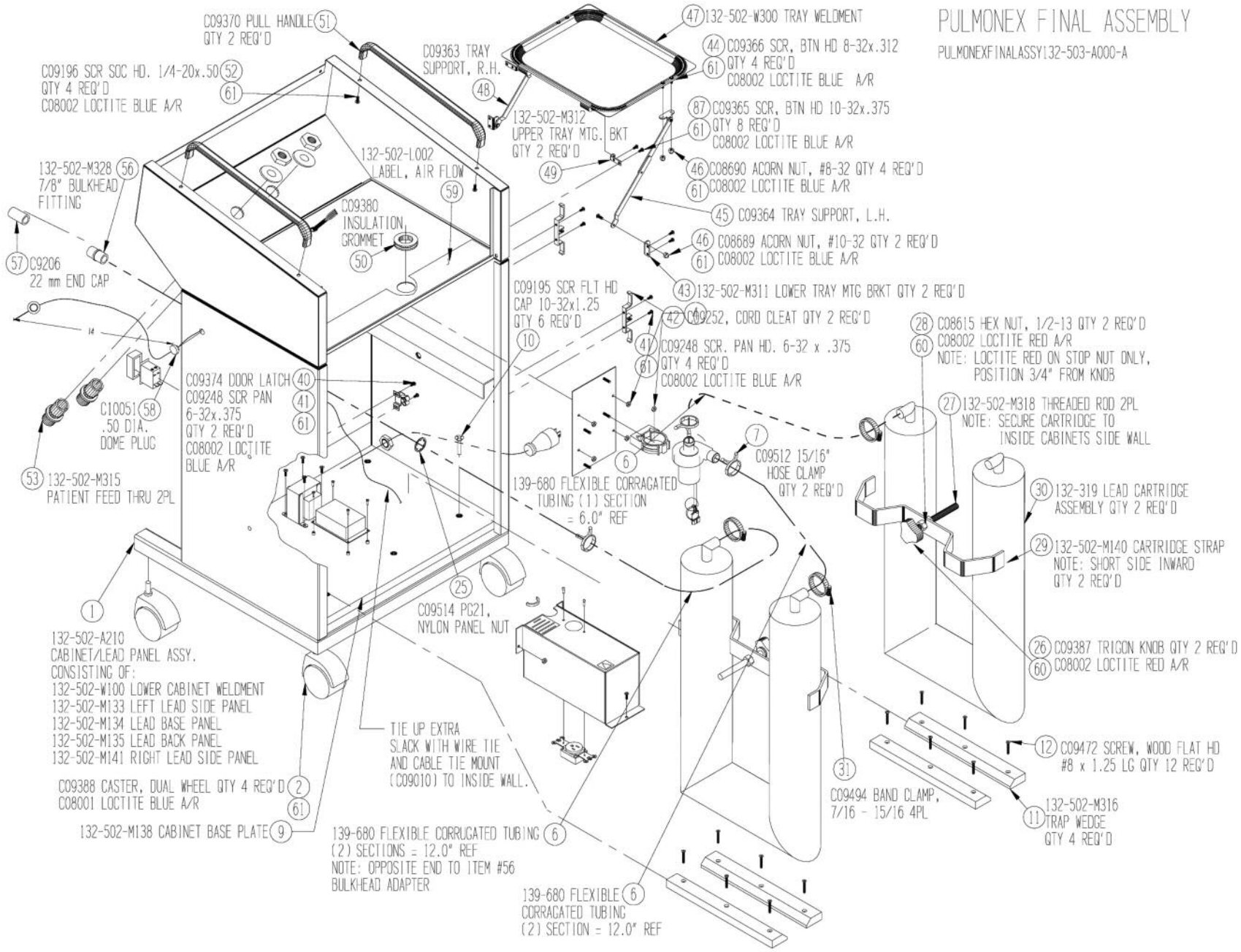
Manufacturer: Biodex Medical Systems
20 Ramsay Road
Shirley, NY 11967

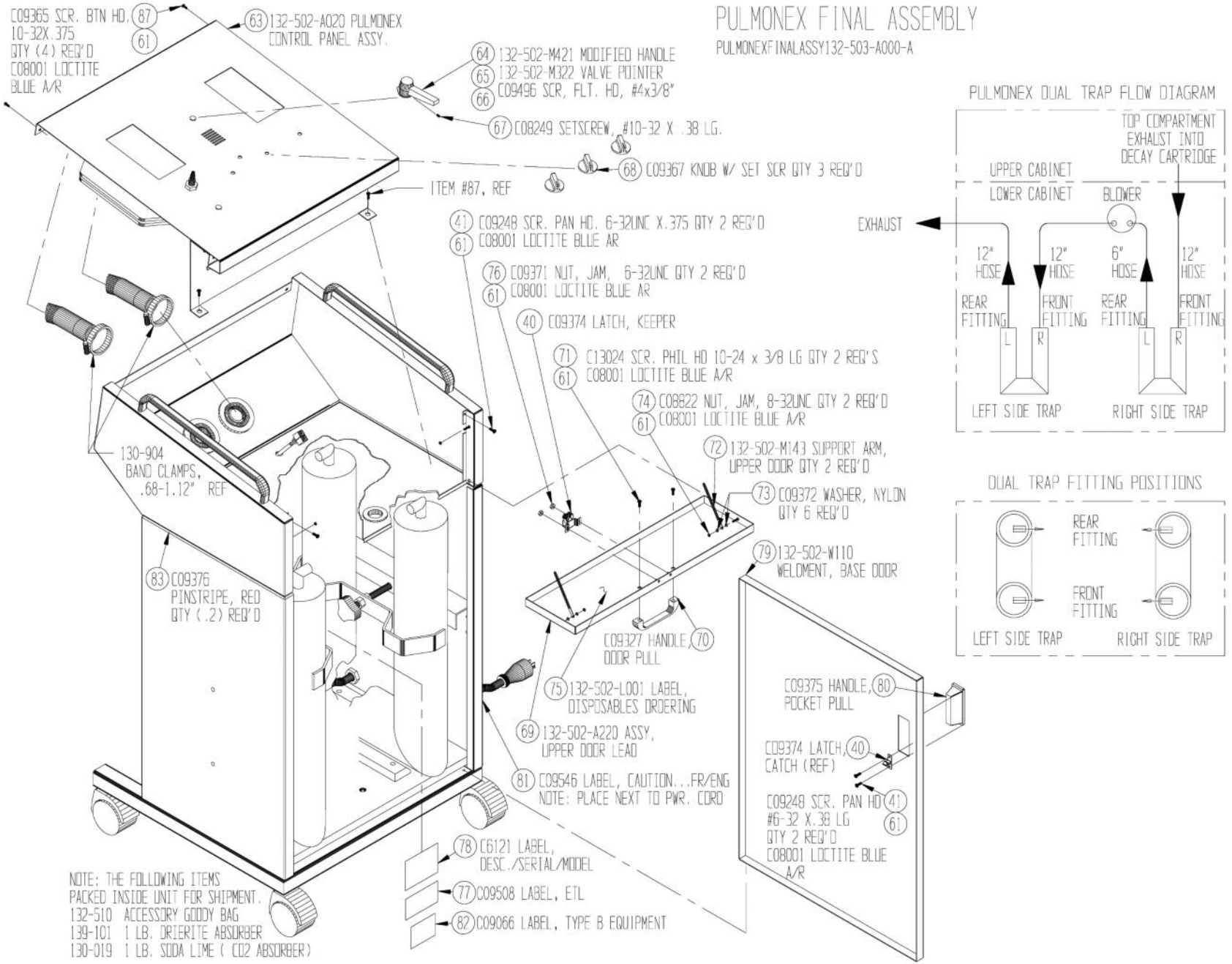
Classification: Class 1, Type B
ordinary equipment

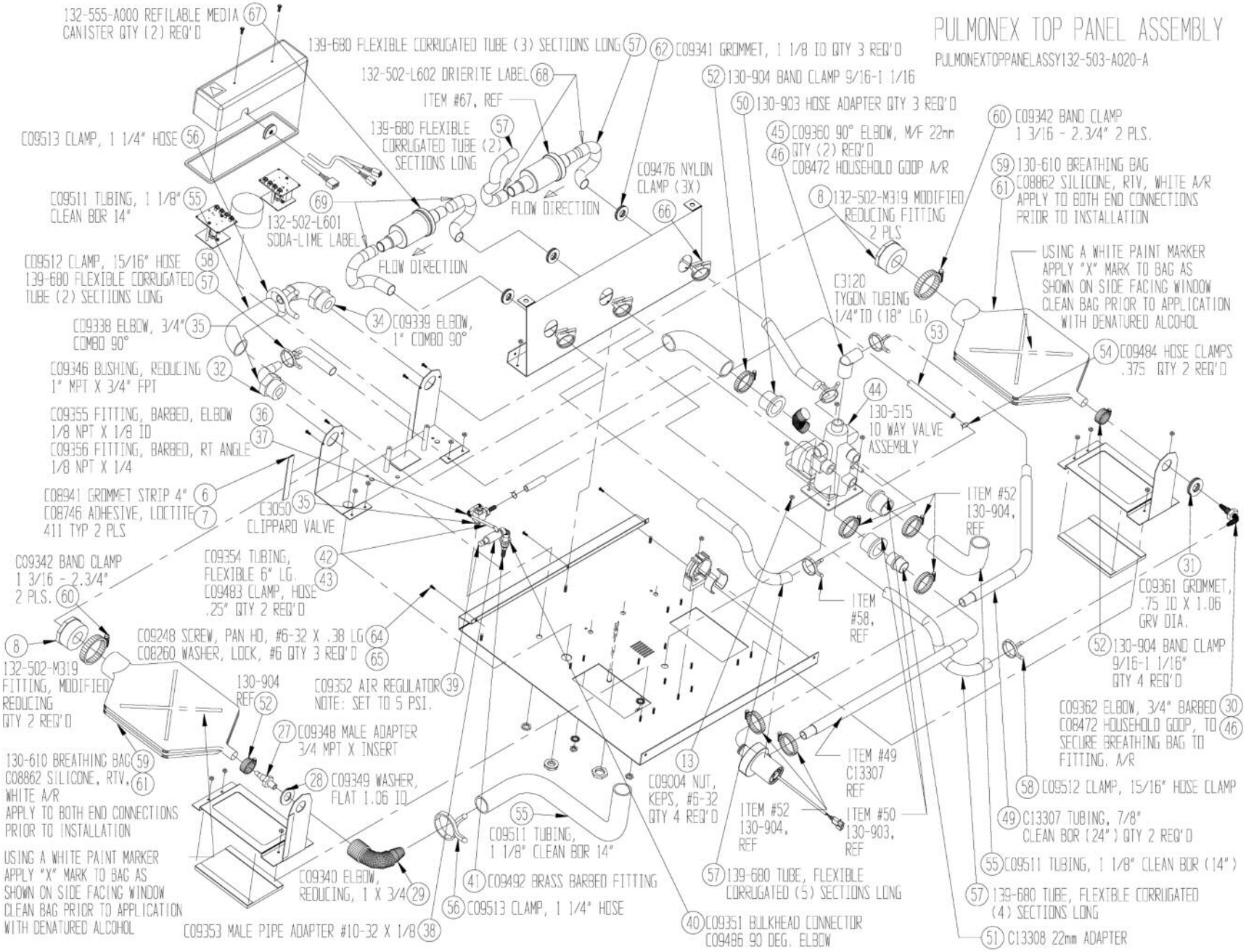
Authorized European Community Representative: Prothia, Paris, France

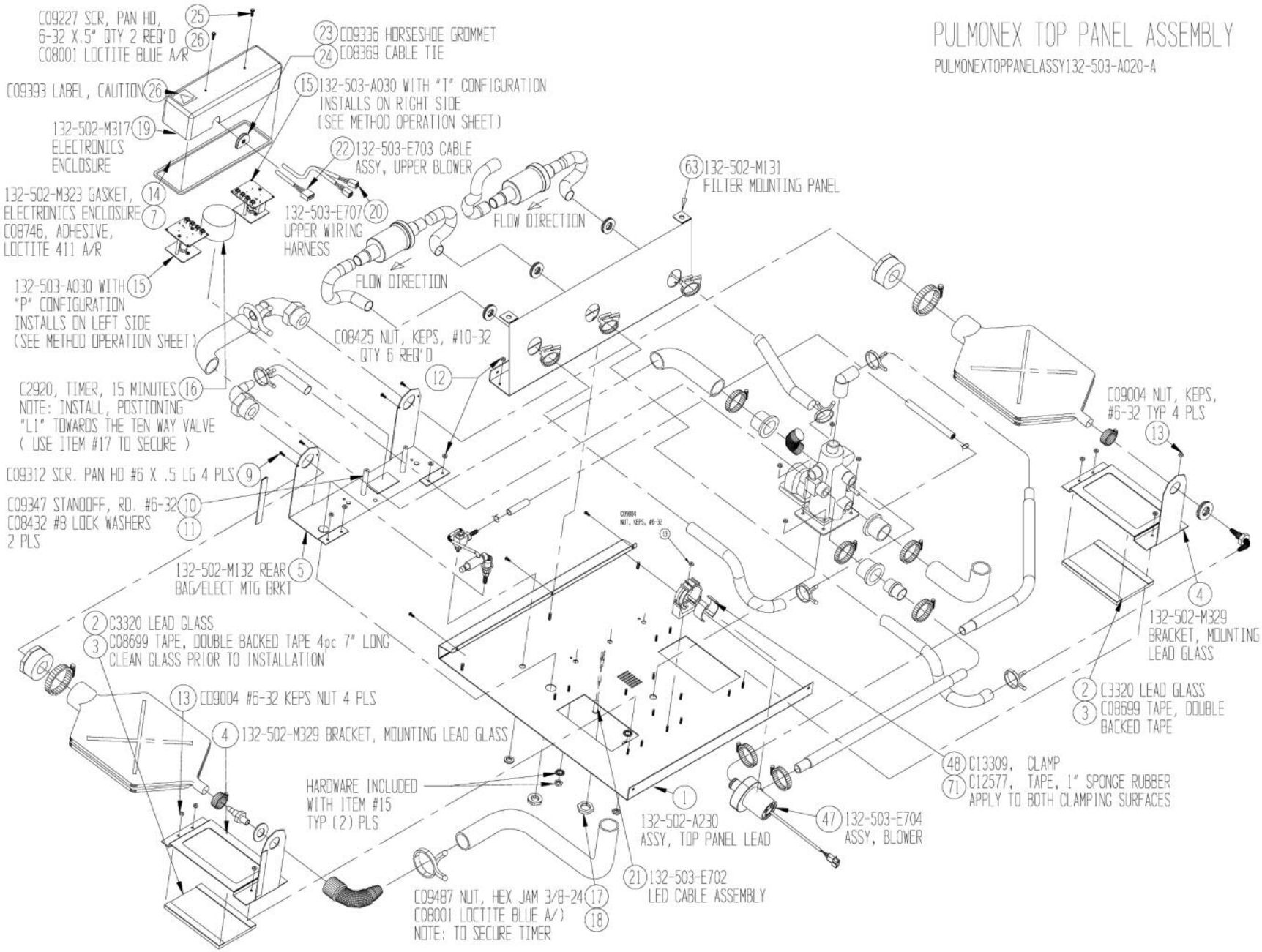
7. REPLACEMENT PARTS

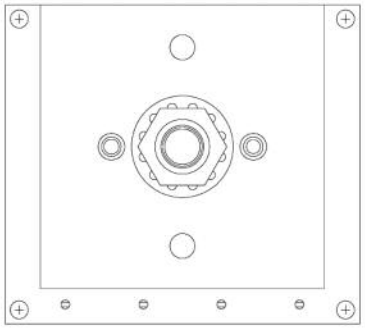

PULMONEX FINAL ASSEMBLY
PULMONEXFINALASSY132-503-A000-A
132-503-E700 LOWER WIRING HARNESS (INSTALLED FROM LOWER CABINET)
C08273 BUSHING SPLIT RING
C09500 1 3/8-12 ELEC. PANEL NUT (2X)
C09377 FLAT WASHER 1 1/4" QTY 2 REQ'D EA.
SEE NOTE 1
IF XENON METER OPTION IS ORDERED WITH PULMONEX A .5 DIA STRAIN RELIEF BUSHING (C08956) SHOULD BE USED
C08928 STRAIN RELIEF 945-110-E730 110V PWR. CORD
132-502-M314 BLOWER MTG PLATE
C08425 KEPS NUT, #10-32 QTY (5) REQ'D
C13309, CLAMP
C12577, TAPE, 1" SPONGE RUBBER APPLY TO BOTH CLAMPING SURFACES
132-503-E704 BLOWER ASSY SEE NOTE 1
(2) MOUNTING SCREWS INCLUDED W. HOSPITAL GRADE RECEPTACLE
C08425 KEPS NUT, #10-32
C08899 RECEPTICLE, SINGLE HOSPITAL GRADE, 15A SEE NOTE 1
132-502-L610 RECEPTACLE WARNING LABEL
C09393 CAUTION/WARNING LABEL
C09386 SCR, TRUSS HD #8x.5 LG
132-503-W100 WELDMENT, DC PWR SPLY / XMFR CVR
C09386 SCR TRUSS HD #8x.5 LG SEE NOTE 1
C09385 110/220 V XFORM SEE NOTE 1
C09384 CIRCUIT BREAKER
C09408 BEZEL CIRCUIT BKRT.
ON } BLACK P1
OFF } WHITE P2
C12164 SPACER, NYLON, #4 X .187 LG.
C10063 SCREW, PHP, #4 X .5 LG TYPE AB QTY (4) EA REQ'D
C13300 POWER SUPPLY, 12VDC
132-503-E705 CABLE ASSY, SECONDARY X-FMR SEE NOTE 1
C08941 GROMMET STRIP TYP 2 PLS 3" EA
C08746 411 LOCTITE A/R
132-502-E712 CHASSIS GND. CABLE.
C08189 WASHER #10 FLAT
132-502-E713 CRT BKT/XFORM BLK CABLE.
132-502-E714 CRT BKT/XFORM WHT CAMBLE.
C09383 NYLON CA. HOLD DOWN QTY(3) REQ'D
C09020 CHASSIS GROUND LABEL
132-503-E701 CHASSIS GND. CABLE
C08923 CABLE CLAMP,1/4 ID, #10 SCR MT, NYL (4PL)
SEE NOTE 1
NOTE:
1. SEE WIRING SCHEMATIC / INTERCONNECTOR P/N 132-503-E706 FOR DETAILS


PULMONEX FINAL ASSEMBLY
PULMONEXFINALASSY132-503-A000-A
C09370 PULL HANDLE (51) QTY 2 REQ'D
C09196 SCR SOC HD. 1/4-20x.50 (52) QTY 4 REQ'D C08002 LOCTITE BLUE A/R (61)
C09363 TRAY SUPPORT, R.H. (48)
(47) 132-502-W300 TRAY WELDMENT
(44) C09366 SCR, BTN HD 8-32x.312 (61) QTY 4 REQ'D C08002 LOCTITE BLUE A/R
(87) C09365 SCR, BTN HD 10-32x.375 (61) QTY 8 REQ'D C08002 LOCTITE BLUE A/R
132-502-M312 UPPER TRAY MTG. BKT QTY 2 REQ'D (49)
132-502-L002 LABEL, AIR FLOW (59)
132-502-M328 (56) 7/8" BULKHEAD FITTING
C09380 INSULATION GROMMET (50)
(46) C08690 ACORN NUT, #8-32 QTY 4 REQ'D (61) C08002 LOCTITE BLUE A/R
(45) C09364 TRAY SUPPORT, L.H.
(46) C08689 ACORN NUT, #10-32 QTY 2 REQ'D (61) C08002 LOCTITE BLUE A/R
(57) C9206 22 mm END CAP
(43) 132-502-M311 LOWER TRAY MTG BRKT QTY 2 REQ'D
C09195 SCR FLT HD CAP 10-32x1.25 QTY 6 REQ'D (10)
(42) C09252, CORD CLEAT QTY 2 REQ'D
(41) C09248 SCR. PAN HD. 6-32 x .375 (61) QTY 4 REQ'D C08002 LOCTITE BLUE A/R
(28) C08615 HEX NUT, 1/2-13 QTY 2 REQ'D
(60) C08002 LOCTITE RED A/R
NOTE: LOCTITE RED ON STOP NUT ONLY, POSITION 3/4" FROM KNOB
(27) 132-502-M318 THREADED ROD 2PL
NOTE: SECURE CARTRIDGE TO INSIDE CABINETS SIDE WALL
C09374 DOOR LATCH (40)
C09248 SCR PAN 6-32x.375 (41) (61) QTY 2 REQ'D C08002 LOCTITE BLUE A/R
C10051 (58) .50 DIA. DOME PLUG
(53) 132-502-M315 PATIENT FEED THRU 2PL
(6) (7) C09512 15/16" HOSE CLAMP QTY 2 REQ'D
139-680 FLEXIBLE CORRAGATED TUBING (1) SECTION = 6.0" REF
(30) 132-319 LEAD CARTRIDGE ASSEMBLY QTY 2 REQ'D
(29) 132-502-M140 CARTRIDGE STRAP
NOTE: SHORT SIDE INWARD
QTY 2 REQ'D
(25) C09514 PG21, NYLON PANEL NUT
(26) C09387 TRIGON KNOB QTY 2 REQ'D
(60) C08002 LOCTITE RED A/R
(1) 132-502-A210 CABINET/LEAD PANEL ASSY.
CONSISTING OF:
132-502-W100 LOWER CABINET WELDMENT
132-502-M133 LEFT LEAD SIDE PANEL
132-502-M134 LEAD BASE PANEL
132-502-M135 LEAD BACK PANEL
132-502-M141 RIGHT LEAD SIDE PANEL
TIE UP EXTRA SLACK WITH WIRE TIE AND CABLE TIE MOUNT (C09010) TO INSIDE WALL.
(12) C09472 SCREW, WOOD FLAT HD #8 x 1.25 LG QTY 12 REQ'D
(31) C09494 BAND CLAMP, 7/16 - 15/16 4PL
(11) 132-502-M316 TRAP WEDGE QTY 4 REQ'D
C09388 CASTER, DUAL WHEEL QTY 4 REQ'D (2) (61) C08001 LOCTITE BLUE A/R
132-502-M138 CABINET BASE PLATE (9)
139-680 FLEXIBLE CORRUGATED TUBING (6) (2) SECTIONS = 12.0" REF
NOTE: OPPOSITE END TO ITEM #56 BULKHEAD ADAPTER
139-680 FLEXIBLE (6) CORRAGATED TUBING (2) SECTION = 12.0" REF


PULMONEX FINAL ASSEMBLY
PULMONEXFINALASSY132-503-A000-A
C09365 SCR. BTN HD. (87) (61) 10-32X.375 QTY (4) REQ'D C08001 LOCTITE BLUE A/R
(63) 132-502-A020 PULMONEX CONTROL PANEL ASSY.
(64) 132-502-M421 MODIFIED HANDLE
(65) 132-502-M322 VALVE POINTER
(66) C09496 SCR, FLT. HD, #4x3/8"
(67) C08249 SETSCREW, #10-32 X .38 LG.
(68) C09367 KNOB W/ SET SCR QTY 3 REQ'D
ITEM #87, REF
(41) C09248 SCR. PAN HD. 6-32UNC X.375 QTY 2 REQ'D
(61) C08001 LOCTITE BLUE AR
(76) C09371 NUT, JAM, 6-32UNC QTY 2 REQ'D
(61) C08001 LOCTITE BLUE AR
(40) C09374 LATCH, KEEPER
(71) C13024 SCR. PHIL HD 10-24 x 3/8 LG QTY 2 REQ'S
(61) C08001 LOCTITE BLUE A/R
(74) C08822 NUT, JAM, 8-32UNC QTY 2 REQ'D
(61) C08001 LOCTITE BLUE A/R
(72) 132-502-M143 SUPPORT ARM, UPPER DOOR QTY 2 REQ'D
(73) C09372 WASHER, NYLON QTY 6 REQ'D
130-904 BAND CLAMPS, .68-1.12" REF
(79) 132-502-W110 WELDMENT, BASE DOOR
(83) C09376 PINSTRIPE, RED QTY (.2) REQ'D
C09327 HANDLE, (70) DOOR PULL
(75) 132-502-L001 LABEL, DISPOSABLES ORDERING
(69) 132-502-A220 ASSY, UPPER DOOR LEAD
(81) C09546 LABEL, CAUTION...FR/ENG NOTE: PLACE NEXT TO PWR. CORD
C09375 HANDLE, (80) POCKET PULL
C09374 LATCH, (40) CATCH (REF)
C09248 SCR. PAN HD (41) #6-32 X.38 LG (61) QTY 2 REQ'D C08001 LOCTITE BLUE A/R
(78) C6121 LABEL, DESC./SERIAL/MODEL
(77) C09508 LABEL, ETL
(82) C09066 LABEL, TYPE B EQUIPMENT
NOTE: THE FOLLOWING ITEMS PACKED INSIDE UNIT FOR SHIPMENT.
132-510 ACCESSORY GOODY BAG
139-101 1 LB. DRIERITE ABSORBER
130-019 1 LB. SODA LIME (CO2 ABSORBER)
PULMONEX DUAL TRAP FLOW DIAGRAM
TOP COMPARTMENT EXHAUST INTO DECAY CARTRIDGE
UPPER CABINET
LOWER CABINET
BLOWER
EXHAUST
12" HOSE
12" HOSE
6" HOSE
12" HOSE
REAR FITTING
FRONT FITTING
REAR FITTING
FRONT FITTING
L
R
L
R
LEFT SIDE TRAP
RIGHT SIDE TRAP
DUAL TRAP FITTING POSITIONS
REAR FITTING
FRONT FITTING
LEFT SIDE TRAP
RIGHT SIDE TRAP


PULMONEX TOP PANEL ASSEMBLY
PULMONEXTOPPANELASSY132-503-A020-A
132-555-A000 REFILABLE MEDIA CANISTER QTY (2) REQ'D (67)
139-680 FLEXIBLE CORRUGATED TUBE (3) SECTIONS LONG (57)
C09341 GROMMET, 1 1/8 ID QTY 3 REQ'D (62)
132-502-L602 DRIERITE LABEL (68)
ITEM #67, REF
139-680 FLEXIBLE CORRUGATED TUBE (2) SECTIONS LONG (57)
C09513 CLAMP, 1 1/4" HOSE (56)
C09511 TUBING, 1 1/8" CLEAN BOR 14" (55)
132-502-L601 SODA-LIME LABEL (69)
FLOW DIRECTION
C09476 NYLON CLAMP (3X) (66)
C09512 CLAMP, 15/16" HOSE 139-680 FLEXIBLE CORRUGATED TUBE (2) SECTIONS LONG (58) (57)
C09338 ELBOW, 3/4" COMBO 90° (35)
C09339 ELBOW, 1" COMBO 90° (34)
C09346 BUSHING, REDUCING 1" MPT X 3/4" FPT (32)
C09355 FITTING, BARBED, ELBOW 1/8 NPT X 1/8 ID (36)
C09356 FITTING, BARBED, RT ANGLE 1/8 NPT X 1/4 (37)
C08941 GROMMET STRIP 4" (6)
C08746 ADHESIVE, LOCTITE 411 TYP 2 PLS (7)
C3050 CLIPPARD VALVE (35)
C09342 BAND CLAMP 1 3/16 - 2.3/4" 2 PLS. (60)
C09354 TUBING, FLEXIBLE 6" LG. (42)
C09483 CLAMP, HOSE .25" QTY 2 REQ'D (43)
C09248 SCREW, PAN HD, #6-32 X .38 LG (64)
C08260 WASHER, LOCK, #6 QTY 3 REQ'D (65)
132-502-M319 FITTING, MODIFIED REDUCING QTY 2 REQ'D (8)
130-904 REF (52)
C09352 AIR REGULATOR (39)
NOTE: SET TO 5 PSI.
C09348 MALE ADAPTER 3/4 MPT X INSERT (27)
C09349 WASHER, FLAT 1.06 ID (28)
130-610 BREATHING BAG (59)
C08862 SILICONE, RTV, WHITE A/R (61)
APPLY TO BOTH END CONNECTIONS PRIOR TO INSTALLATION
USING A WHITE PAINT MARKER APPLY "X" MARK TO BAG AS SHOWN ON SIDE FACING WINDOW CLEAN BAG PRIOR TO APPLICATION WITH DENATURED ALCOHOL
C09340 ELBOW, REDUCING, 1 X 3/4 (29)
C09353 MALE PIPE ADAPTER #10-32 X 1/8 (38)
C09513 CLAMP, 1 1/4" HOSE (56)
C09492 BRASS BARBED FITTING (41)
C09511 TUBING, 1 1/8" CLEAN BOR 14" (55)
C09351 BULKHEAD CONNECTOR C09486 90 DEG. ELBOW (40)
C09004 NUT, KEPS, #6-32 QTY 4 REQ'D (13)
ITEM #52 130-904, REF
ITEM #50 130-903, REF
139-680 TUBE, FLEXIBLE CORRUGATED (5) SECTIONS LONG (57)
130-904 BAND CLAMP 9/16-1 1/16 (52)
130-903 HOSE ADAPTER QTY 3 REQ'D (50)
C09360 90° ELBOW, M/F 22mm QTY (2) REQ'D (45)
C08472 HOUSEHOLD GOOP A/R (46)
132-502-M319 MODIFIED REDUCING FITTING 2 PLS (8)
C09342 BAND CLAMP 1 3/16 - 2.3/4" 2 PLS. (60)
130-610 BREATHING BAG (59)
C08862 SILICONE, RTV, WHITE A/R (61)
APPLY TO BOTH END CONNECTIONS PRIOR TO INSTALLATION
C3120 TYGON TUBING 1/4"ID (18" LG) (53)
USING A WHITE PAINT MARKER APPLY "X" MARK TO BAG AS SHOWN ON SIDE FACING WINDOW CLEAN BAG PRIOR TO APPLICATION WITH DENATURED ALCOHOL
C09484 HOSE CLAMPS .375 QTY 2 REQ'D (54)
130-515 10 WAY VALVE ASSEMBLY (44)
ITEM #52 130-904, REF
ITEM #58, REF
ITEM #49 C13307 REF
C09361 GROMMET, .75 ID X 1.06 GRV DIA. (31)
130-904 BAND CLAMP 9/16-1 1/16" QTY 4 REQ'D (52)
C09362 ELBOW, 3/4" BARBED (30)
C08472 HOUSEHOLD GOOP, TO SECURE BREATHING BAG TO FITTING. A/R (46)
C09512 CLAMP, 15/16" HOSE CLAMP (58)
C13307 TUBING, 7/8" CLEAN BOR (24") QTY 2 REQ'D (49)
C09511 TUBING, 1 1/8" CLEAN BOR (14") (55)
139-680 TUBE, FLEXIBLE CORRUGATED (4) SECTIONS LONG (57)
C13308 22mm ADAPTER (51)

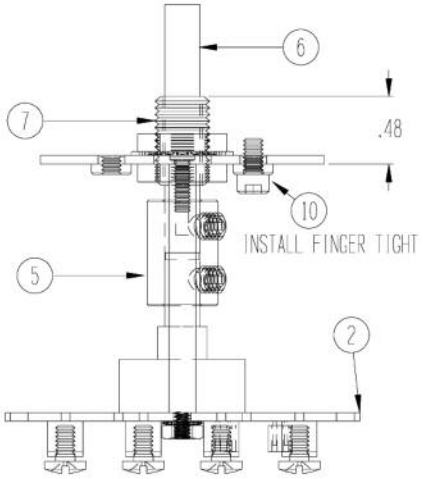

PULMONEX TOP PANEL ASSEMBLY
PULMONEXTOPPANELASSY132-503-A020-A
C09227 SCR, PAN HD, 6-32 X.5" QTY 2 REQ'D
C08001 LOCTITE BLUE A/R
C09393 LABEL, CAUTION
132-502-M317 ELECTRONICS ENCLOSURE
132-502-M323 GASKET, ELECTRONICS ENCLOSURE
C08746, ADHESIVE, LOCTITE 411 A/R
132-503-A030 WITH "P" CONFIGURATION INSTALLS ON LEFT SIDE (SEE METHOD OPERATION SHEET)
C2920, TIMER, 15 MINUTES
NOTE: INSTALL, POSITIONING "L1" TOWARDS THE TEN WAY VALVE (USE ITEM #17 TO SECURE)
C09312 SCR. PAN HD #6 X .5 LG 4 PLS
C09347 STANDOFF, RD. #6-32
C08432 #8 LOCK WASHERS 2 PLS
132-502-M132 REAR BAG/ELECT MTG BRKT
C09336 HORSESHOE GROMMET
C08369 CABLE TIE
132-503-A030 WITH "T" CONFIGURATION INSTALLS ON RIGHT SIDE (SEE METHOD OPERATION SHEET)
132-503-E703 CABLE ASSY, UPPER BLOWER
132-503-E707 UPPER WIRING HARNESS
FLOW DIRECTION
FLOW DIRECTION
C08425 NUT, KEPS, #10-32 QTY 6 REQ'D
132-502-M131 FILTER MOUNTING PANEL
C09004 NUT, KEPS, #6-32 TYP 4 PLS
132-502-M329 BRACKET, MOUNTING LEAD GLASS
C3320 LEAD GLASS
C08699 TAPE, DOUBLE BACKED TAPE 4pc 7" LONG
CLEAN GLASS PRIOR TO INSTALLATION
C09004 #6-32 KEPS NUT 4 PLS
132-502-M329 BRACKET, MOUNTING LEAD GLASS
C3320 LEAD GLASS
C08699 TAPE, DOUBLE BACKED TAPE
C13309, CLAMP
C12577, TAPE, 1" SPONGE RUBBER
APPLY TO BOTH CLAMPING SURFACES
HARDWARE INCLUDED WITH ITEM #15 TYP (2) PLS
132-502-A230 ASSY, TOP PANEL LEAD
132-503-E704 ASSY, BLOWER
132-503-E702 LED CABLE ASSEMBLY
C09487 NUT, HEX JAM 3/8-24
C08001 LOCTITE BLUE A/)
NOTE: TO SECURE TIMER

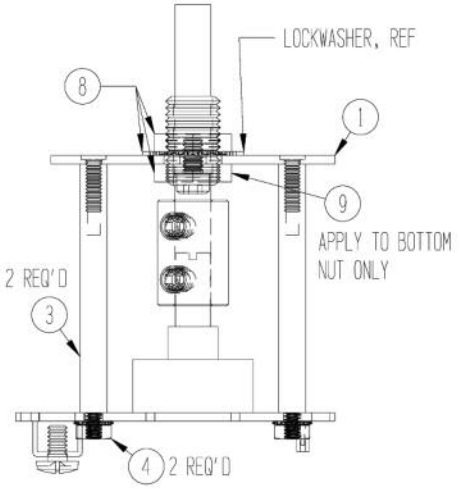


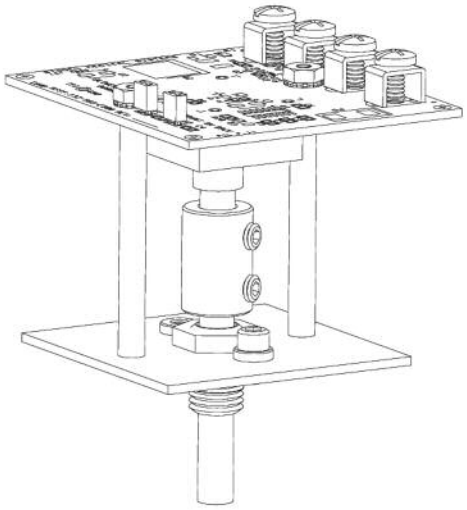
PULMONEX BLOWER PCB ASSY

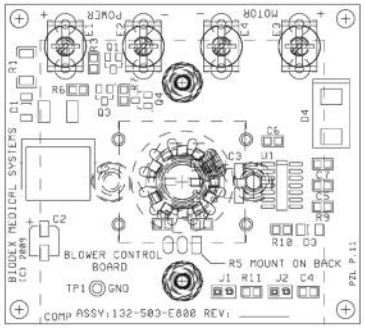
PULMONEXBLOWERPCBASSY132-503-A030-A

NOTES:
IMPORTANT !!
DO NOT INSTALL WITHOUT REFERING TO METHOD SHEET FOR FINAL CONFIGURATION



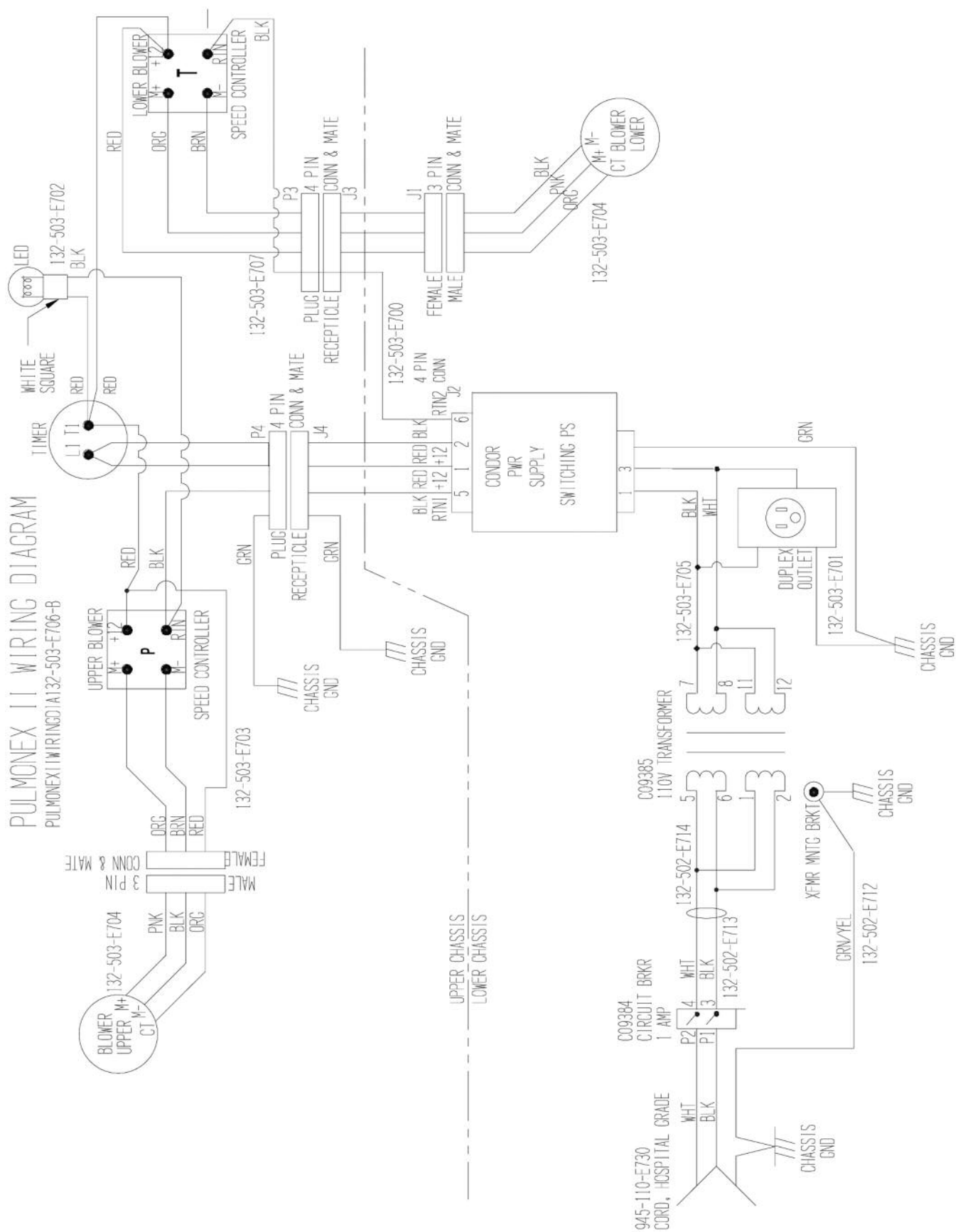






10	1	C11162	SCREW, HEX SKT CAP, 6-32UNC X .25 LG, NYLON
9	A/R	C08001	LOCTITE, BLUE
8	1	C13306	NUT/WASHER SET (USE ONLY (2) NUTS AND (1) LOCKWASHER)
7	1	132-503-M303	SLEEVE, SHAFT
6	1	132-503-M302	EXTENSION, SHAFT
5	1	C13305	COUPLING, 1/4" SHAFT
4	2	C09247	NUT, KEPS, 4-40UNC, ST STL
3	2	C13304	STANOFF, 1/4" RND, 1.75" LG M/F, 4-40UNC
2	1	132-503-E800	PCB, PULMONEX BLOWER CONTROL
1	1	132-503-M301	BRACKET, BLOWER PCB MOUNT

8. SCHEMATICS



Certified Quality Management System

BIODEX

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